

State/Industry Network

Air Quality Report

2nd Quarter 2000

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North Dakota Department of Health

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SECTION ONE

DISCUSSION OF
MONITORING RESULTS

Sulfur Dioxide (SO₂)

There were no exceedances of the state or federal standards during the quarter. The maximum 1-hour concentration was 149 ppb on May 30 at Short Creek - SPM; the maximum 3-hour concentration was 112 ppb on April 5 at Mandan - SPM; and, the maximum 24-hour concentration was 41 ppb on June 14 at Mandan - SPM. All sites achieved at least an 80% data recovery for the period

Sulfur Dioxide (SO₂) 5-Minute Average

The maximum 5-minute concentration was 381 ppb on May 30 at Short Creek - SPM.

Ozone (O₃)

There was no exceedance of the ozone standard during the quarter. The maximum observed 1-hour concentration was 78 ppb on June 9 at Fargo NW. The maximum 8-hour concentration was 66 ppb on June 9 at Fargo NW. All sites achieved at least an 80% data recovery for the period operated except for Dunn Center.

Dunn Center failed to achieve 80% due to an analyzer failure.

Nitrogen Dioxide (NO₂)

The maximum 1-hour concentration observed was 94 ppb on May 15 at DGC #17. All sites achieved at least an 80% data recovery for the period operated.

Inhalable FRM PM_{2.5} Particulates

The maximum 24-hour average concentration was 17.8 µg/m³ on June 12 at Sharon. All sites achieved at least an 80% data recovery for the period operated.

Inhalable PM₁₀ Particulates

There was no exceedance of the 24-hour standard during the quarter. The maximum 24-hour average concentration was 54.3 $\mu\text{g}/\text{m}^3$ on May 30 at Short Creek - SPM. Both sites achieved at least an 80% data recovery for the period operated.

Inhalable PM₁₀ Sulfates (SO₄)

The purpose for sulfate analysis is to aid the Department in assessing the impact of SO₂ emissions on inhalable particulate concentrations and visibility. The maximum 24-hour PM₁₀ sulfate concentration was 2.0 $\mu\text{g}/\text{m}^3$ on April 24 at Fargo NW. Both sites achieved at least an 80% data recovery for the period operated.

PM₁₀ Sulfate/PM₁₀ Analysis

The PM₁₀ sulfate/PM₁₀ total mass tables present statistics for PM₁₀ sulfate and PM₁₀ total mass when both concentrations are greater than the respective minimum detectable concentration: 0.5 $\mu\text{g}/\text{m}^3$ for PM₁₀ sulfate analysis; 4 $\mu\text{g}/\text{m}^3$ for PM₁₀ total mass. Statistics for the ratio are produced by evaluating the ratio of the PM₁₀ sulfate concentration to the PM₁₀ total mass concentration for each data pair. In the individual summaries, one-half of the minimum detectable concentration is substituted for those concentrations less than the minimum detectable value. However, when the PM₁₀ total mass concentration is less than 4 $\mu\text{g}/\text{m}^3$, the PM₁₀ sulfate concentration can be higher than the PM₁₀ total mass concentration. This is because of the variability in the sulfate analysis procedure at low concentrations. Therefore, when calculating the ratio of PM₁₀ sulfate concentration to PM₁₀ total mass concentration, only data pairs where both the PM₁₀ sulfate and PM₁₀ total mass concentrations are greater than the minimum detectable concentrations are used. When the ratio is multiplied by 100, it becomes the percentage of total mass which is sulfate. The maximum 24-hr PM₁₀ Sulfate/PM₁₀ total mass ratio was 0.175 (17.5%) on April 18 at Fargo NW. The maximum average ratio was 0.081 (8.1%) at Fargo NW.

SECTION TWO

AMBIENT AIR QUALITY DATA

SUMMARIES

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Sulfur Dioxide (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	1 - HOUR		M A X I M A		24 - HOUR		ARITH MEAN	1HR #>273	24HR #>99	% >MDV
				1ST MM/DD/HH	2ND MM/DD/HH	1ST MM/DD/HH	2ND MM/DD/HH	1ST MM/DD	2ND MM/DD				
Amerada Hess - Tioga #1	2000	APR-JUN	2166	25 04/18/04	22 04/17/09	14 05/21/02	13 04/18/05	3 04/18	3 05/21	1.3			10.2
Amerada Hess - Tioga #3	2000	APR-JUN	2166	56 06/16/16	49 06/14/05	37 06/21/17	36 05/03/08	13 06/21	12 06/25	3.3			24.1
Bear Paw - MGP #3	2000	APR-JUN	2168	7 05/08/07	7 06/24/16	5 04/15/11	4 04/03/08	3 04/15	2 06/21	1.1			7.9
Bear Paw - MGP #5	2000	APR-JUN	2162	42 04/04/02	42 04/04/03	18 04/04/02	15 04/04/05	5 04/04	5 04/15	1.3			10.6
Beulah - North	2000	APR-JUN	2171	56 05/16/08	39 04/25/10	26 04/25/11	25 05/16/08	6 04/30	6 06/14	2.2			29.8
DGC #12	2000	APR-JUN	2171	41 04/25/10	31 05/16/07	26 04/25/11	21 05/16/08	6 05/16	6 06/21	1.9			19.5
DGC #14	2000	APR-JUN	2162	51 04/25/13	41 06/30/09	28 04/25/14	25 06/30/11	8 04/25	5 06/30	1.8			15.9
DGC #16	2000	APR-JUN	2044	53 04/23/15	51 05/18/09	47 05/18/11	28 04/23/17	11 05/18	9 05/26	2.3			31.5
DGC #17	2000	APR-JUN	2169	45 05/18/08	43 05/25/04	33 05/18/11	31 04/23/02	10 06/11	9 06/19	2.6			38.1
Dunn Center	2000	APR-JUN	2171	9 04/15/10	9 04/15/18	8 04/15/20	7 04/15/11	3 04/15	2 06/08	1.2			8.1
Fargo NW	2000	APR-JUN	2166	5 04/25/03	5 06/06/21	3 06/06/23	2 06/11/23	1 04/01	1 06/30	1.0			1.1
Hannover	2000	APR-JUN	2169	53 05/26/06	51 05/26/05	24 05/26/08	23 06/11/08	6 04/13	6 05/26	1.9			17.9
Mandan - SPM	2000	APR-JUN	2164	135 04/05/20	114 04/05/18	112 04/05/20	76 04/03/05	41 06/14	36 04/03	4.9			35.9
Mandan NW - SPM	2000	APR-JUN	2171	91 04/12/04	84 04/12/08	66 04/12/05	62 04/12/08	25 04/12	14 05/26	3.2			35.5

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : SULFUR DIOXIDE (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	1 - HOUR		M A X I M A		24 - HOUR		ARITH MEAN	1HR #>273	24HR #>99	% >MDV
				1ST MM/DD/HH	2ND MM/DD/HH	1ST MM/DD/HH	2ND MM/DD/HH	1ST MM/DD	2ND MM/DD				
Sharon	2000	APR-JUN	2174	1 04/01/00	1 04/01/01	1 04/01/02	1 06/30/23	1 04/01	1 06/30	1.0			0.0
Short Creek - SPM	2000	APR-JUN	2168	149 05/30/08	131 05/30/09	52 05/30/08	46 05/30/11	16 05/30	7 06/07	2.1			17.9
TRNP - SU (Painted Canyon)	2000	APR-JUN	1897	8 04/15/20	7 04/13/08	6 04/15/20	4 06/12/08	2 04/13	2 06/12	1.1			3.7
White Shield	2000	APR-JUN	2173	47 04/16/09	33 05/01/12	18 04/16/11	14 05/01/14	5 04/16	5 06/06	1.4			11.3

The maximum 1-hour concentration is 149 ppb at Short Creek - SPM on 05/30/08
 The maximum 3-hour concentration is 112 ppb at Mandan - SPM on 04/05/20
 The maximum 24-hour concentration is 41 ppb at Mandan - SPM on 06/14

* The air quality standards are:

STATE Standards -

- 1) 273 ppb maximum 1-hour average concentration.
- 2) 99 ppb maximum 24-hour average concentration.
- 3) 23 ppb maximum annual arithmetic mean concentration.

FEDERAL Standards -

- 1) 500 ppb maximum 3-hour concentration not to be exceeded more than once per year.
- 2) 140 ppb maximum 24-hour concentration not to be exceeded more than once per year.
- 3) 30 ppb annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Sulfur Dioxide 5-Minute Averages (ppb)

LOCATION	YEAR	PERIOD	OBS	5 - M I N U T E			M A X I M A			# HOURS >600	% >MDV
				1ST DATE MM/DD/HH	2ND DATE MM/DD/HH	3RD DATE MM/DD/HH	1ST DATE MM/DD/HH	2ND DATE MM/DD/HH	3RD DATE MM/DD/HH		
Bear Paw - MGP #3	2000	APR-JUN	2168	29	05/08/07	19	04/08/17	19	06/19/18	0	17.5
Bear Paw - MGP #5	2000	APR-JUN	2162	198	04/04/03	134	04/04/02	79	04/04/01	0	20.4
Beulah - North	2000	APR-JUN	2171	80	05/16/08	57	04/16/08	55	04/25/10	0	41.3
Dunn Center	2000	APR-JUN	2171	11	04/15/10	11	04/15/18	11	04/18/14	0	14.8
Fargo NW	2000	APR-JUN	2166	5	04/25/03	5	06/25/21	4	04/25/02	0	1.1
Hannover	2000	APR-JUN	2169	83	04/09/09	79	05/09/06	77	05/26/05	0	26.8
Mandan - SPM	2000	APR-JUN	2164	185	04/05/20	162	04/05/18	155	04/05/22	0	46.8
Mandan NW - SPM	2000	APR-JUN	2171	151	05/25/09	143	05/25/08	126	04/12/04	0	50.3
Sharon	2000	APR-JUN	2174	1	04/16/11	1	04/16/12	1	05/21/08	0	0.0
Short Creek - SPM	2000	APR-JUN	2168	381	05/30/08	365	05/30/09	114	04/03/10	0	25.6
TRNP - SU (Painted Canyon)	2000	APR-JUN	1897	8	04/15/20	7	04/15/08	7	06/12/08	0	3.7

The maximum 5-minute concentration is 381 ppb at Short Creek - SPM on 05/30/08

* No Standard is currently in effect:

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Ozone (PPB)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	1 - HOUR		M A X I M A 8 - HOUR				1HR #>120	8HR #>80
				1ST MM/DD/HH	2ND MM/DD/HH	1ST MM/DD/HH	2ND MM/DD/HH	3RD MM/DD/HH	4TH MM/DD/HH		
Beulah - North	2000	APR-JUN	2170	60 04/23/15	60 05/26/13	55 04/23/10	54 04/23/09	54 05/26/11	54 05/26/10		
Dunn Center	2000	APR-JUN	1757 ***	57 05/26/15	56 04/22/14	54 05/02/08	54 04/28/09	53 05/14/09	53 05/14/08		
Fargo NW	2000	APR-JUN	2163	78 06/09/14	75 06/09/15	71 06/09/11	66 06/09/10	66 06/09/09	66 06/09/12		
Hannover	2000	APR-JUN	2172	61 05/11/11	60 05/11/10	56 05/27/10	55 05/27/09	55 05/14/11	55 05/05/09		
Sharon	2000	APR-JUN	2172	69 06/09/17	68 05/05/16	64 06/09/10	59 06/09/09	59 06/09/11	59 04/25/10		
TRNP - SU (Painted Canyon)	2000	APR-JUN	2169	63 06/08/12	62 06/30/16	58 06/30/11	57 06/30/10	57 06/30/09	57 06/08/08		

The maximum 1-hour concentration is 78 ppb at Fargo NW on 06/09/14
The 4th highest 8-hour concentration is 66 ppb at Fargo NW on 06/09/12

* The air quality standards for ozone are:
STATE - 120 ppb not to be exceeded more than once per year.

FEDERAL - Fourth highest daily maximum 8-hour averages for a 3-year period not to exceed 80 ppb.

*** Less than 80% of the possible samples (data) were collected.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Nitrogen Dioxide (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	M A X I M A 1 - HOUR		ARITH MEAN	% >MDV
				1ST MM/DD/HH	2ND MM/DD/HH		
Beulah - North	2000	APR-JUN	2168	33 05/04/19	32 05/16/08	3.6	85.1
DGC #12	2000	APR-JUN	2163	35 05/08/22	33 05/08/21	3.4	84.5
DGC #17	2000	APR-JUN	2115	94 05/15/00	67 04/16/00	4.2	98.5
Dunn Center	2000	APR-JUN	2162	11 05/29/20	11 05/31/09	1.9	47.3
Fargo NW	2000	APR-JUN	2158	34 05/20/21	33 04/01/20	5.6	80.3
Hannover	2000	APR-JUN	2164	27 06/19/00	20 05/26/06	2.3	59.1
Sharon	2000	APR-JUN	2169	14 05/04/20	9 04/20/19	1.8	50.9
Short Creek - SPM	2000	APR-JUN	2166	19 06/07/23	17 06/07/09	3.1	78.7

The maximum 1-hour concentration is 94 ppb at DGC #17 on 05/15/00

* The air quality standards are:
STATE - 53 ppb maximum annual arithmetic mean.
FEDERAL - 53 ppb annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable FRM PM_{2.5} Particulates (µg/m³)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A 24 - HOUR			ARITH MEAN	#> 65	AM>15	% >MDV
					1ST MM/DD	2ND MM/DD	3RD MM/DD				
Beulah - North	2000	APR-JUN	15	3.0	7.5 05/06	6.8 06/23	6.7 04/12	5.0			100.0
Bismarck Residential	2000	APR-JUN	29	2.5	9.5 04/24	8.5 04/21	7.9 04/12	5.1			100.0
Dickinson Residential	2000	APR-JUN	14	2.8	5.4 04/12	5.2 06/05	5.0 04/15	4.5			100.0
Fargo NW	2000	APR-JUN	29	1.8	8.5 06/08	8.3 05/03	7.9 04/21	5.0			93.1
Grand Forks - North	2000	APR-JUN	29	2.2	9.9 04/24	9.7 04/12	8.8 04/21	5.3			100.0
Lignite - SPM	2000	APR-JUN	13	3.0	10.1 04/18	6.5 05/30	6.3 04/06	4.9			100.0
Sharon	2000	APR-JUN	14	2.1	17.8 06/12	8.5 04/24	6.2 05/06	5.5			100.0
Short Creek - SPM	2000	APR-JUN	15	2.8	6.8 04/30	6.8 05/06	6.7 06/23	4.9			100.0

The maximum 24-hour concentration is 17.8 µg/m³ at Sharon on 06/12

* The ambient air quality standards are:

FEDERAL Standards -

- 1) 24-hour: 3-year average of 98th percentiles not to exceed 65 µg/m³.
- 2) Annual: 3-year average not to exceed 15 µg/m³.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable PM₁₀ Particulates (µg/m³)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A 24 - HOUR			ARITH MEAN	#>150	AM>50	% >MDV
					1ST MM/DD	2ND MM/DD	3RD MM/DD				
Dragswolf	2000	APR-JUN	15	3.6	17.4 05/24	11.4 06/05	9.2 06/23	7.5			93.3
Fargo NW	2000	APR-JUN	13	4.5	39.1 05/06	31.4 05/24	21.0 04/24	15.5			100.0
Short Creek - SPM	2000	APR-JUN	15	6.1	54.3 05/30	43.3 05/24	36.1 04/30	23.2			100.0
White Shield	2000	APR-JUN	15	4.2	13.5 05/24	11.1 06/05	9.6 04/12	7.3			100.0

The maximum 24-hour concentration is 54.3 µg/m³ at Short Creek - SPM on 05/30

* The STATE and FEDERAL air quality standards are:

- 1) 150 µg/m³ maximum averaged over a 24-hour period with no more than one expected exceedance per year.
- 2) 50 µg/m³ expected annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable PM₁₀ Sulfates (µg/m³)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A 24 - HOUR			ARITH MEAN	#>15.	AM>5.	% >MDV
					1ST MM/DD	2ND MM/DD	3RD MM/DD				
Fargo NW	2000	APR-JUN	13	0.3	2.0 04/24	1.6 04/12	1.4 04/18	0.9			92.3
Short Creek - SPM	2000	APR-JUN	15	0.2	1.8 04/18	1.5 04/12	1.5 05/18	1.0			86.6

The maximum 24-hour concentration is 2.0 µg/m³ at Fargo NW on 04/24

* No standard is currently in effect.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : PM₁₀ Sulfate/PM₁₀ Total Mass Ratio (Percentage)

LOCATION	YEAR	SAMPLING PERIOD	NUM		M A X I M A			ARITH MEAN
			OBS	MIN	1ST MM/DD	2ND MM/DD	3RD MM/DD	
Fargo NW	2000	APR-JUN	12	2.5	17.5 04/18	16.7 04/12	13.3 04/06	8.1
Short Creek - SPM	2000	APR-JUN	13	1.8	16.1 04/12	13.5 04/18	9.9 05/18	6.4

The maximum 24-hour ratio is 17.5 percent at Fargo NW on 04/18

* No standard is currently in effect.

SECTION THREE

EXCEEDANCE LISTINGS

By Site Date Hour

All Units Are in Parts Per Billion Except Wind Direction (Degrees),
Wind Speed (MPH), CO (PPM), and PM_{2.5} and PM₁₀ ($\mu\text{g}/\text{m}^3$)

The * Identifies the Exceedances

NONE

By Date Hour Site

All Units Are in Parts Per Billion Except Wind Direction (Degrees),
Wind Speed (MPH), CO (PPM), and PM_{2.5} and PM₁₀ ($\mu\text{g}/\text{m}^3$)

The * Identifies the Exceedances

NONE

